CONSTRUAL LEVEL, SELF-KNOWLEDGE AND ACADEMIC MOTIVATION: KNOWING WHY YOU PURSUE YOUR GOALS PROMOTES ACADEMIC MOTIVATION

An Undergraduate Research Scholars Thesis

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ABSTRACT

Construal level, Self Knowledge and Academic Motivation: Knowing Why You Pursue Your Goals Promotes Academic Motivation

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Literature Review

This study was based on the interaction between two theories, one of which describes how individuals conceptualize their goals (Construal Level Theory) and the other addresses the understanding of the self (Self-knowledge). Construal Level Theory discusses how individuals conceptualize their goals and how this mental representation of goals impacts motivation. Self-knowledge addresses the extent to which individuals know themselves and use this knowledge as a guide for acting towards their intrinsic goals. Both of these theories have been studied individually to assess their impact on motivation. Construal level Theory has been proved effective in influencing motivation and self-knowledge has been studied as the core construct of other self-constructs that have implications on motivation (self-efficacy & self-concept). However, few studies have looked at the influence of the interaction of both of these constructs on motivation.

Thesis Statement

The relationship between goal construal level and academic motivation will be mediated by both the behavioral and authentic components of self-knowledge.

Theoretical Framework

Both Construal Level Theory (CLT) and Action Identification Theory (AIT) identify how actions are seen as having either high-level or low-level identities. How individuals conceptualize their actions can impact levels of self-knowledge. Knowing themselves helps identify their interests which guides behavior and choices for goals that align with their authentic selves which impact motivation levels. Academic motivation is the level of motivation towards the achievement of academic goals.

Project Description

The aim of this study is to examine the mediating effect of self-knowledge on the relationship between construal level and academic achievement. This study was conducted as a computerized study, in which construal level was manipulated and questionnaires assessed levels of self-knowledge. The manipulation consisted of a written activity that induced either high or low-level construal of goals. Then, participants were asked to respond to questionnaires (measuring the extent to which they agree with certain prompts) assessing self-knowledge and motivation. For the analysis, mediations were analyzed with PROCESS Macro in SPSS and we also ran two-way ANOVAS.

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KEY WORDS

AIT	Action Identification Theory
CLT	Construal Level Theory
SK	Self-Knowledge

INTRODUCTION

Academic achievement and strides in education are one of the most certain ways of opening doors to new opportunities in the professional world. Although our society has increased academic enrollment between generations, as a whole: (education index scores for the measuring America project has found an increase of 11.5% of increased educational attainment from 2005 to 2016 (Measure of America, 2018)), there is still a long way to go before this becomes a universal standard. Data from the Georgetown University Center on Education and the Workforce states that by 2020, 35% of jobs will require a bachelor's degree and 30% of job openings will require some college or an associate's degree (Carnevale at al., 2013).

Motivation is one of the multiple factors influencing academic success and has been widely studied among several fields of research including educational psychology, educational policy, law and clinical psychology. A variety of theoretical approaches have been derived from these fields to explain the causes and factors that impact motivation. Social psychologists have addressed the topic of motivation by assessing how people visualize, conceptualize and evaluate their goals (Tesser, 2000). Psychologists have developed different theories that attempt to explain individuals' construction and sources of motivation. One of these theories includes Construal Level Theory, derived from Action Identification Theory.

Action Identification Theory

Action Identification Theory (AIT) was developed by Vallacher and Wegner (1987). AIT deals with the relevance of small actions for goal achievement by assimilating how actions and details of what we do shape the understanding of our goals. That way, AIT helps pave the way to comprehend deeper issues such as meaning in life (McGregor & Brian, 1998). AIT separates

actions into low-level and high-level identities. Lower-level identities convey details, which encompass specific mechanisms to perform an action. Higher-level identities assess the broader understanding of an action, indicating its meaning.

Vallacher and Wegner (1987) specify the principles by which people adopt a single act identity, or conceptualization of an act by underlining the conditions through which individuals change the way of understanding their actions. AIT serves as the basis of several theories because it addresses ideas about the relationship between thoughts and behavior. Two of these theories include Construal Level Theory and Self-Regulation Theory. AIT distinguishes between present and future dispositions as well, explaining how factors such as distance and time impact the conceptualization of our goals.

Several hypotheses have been made about the type, valance and value of outcomes based on time discounting, which state that people discount the value of a reward by a factor that increases with the length of the delay of a reward. Findings largely show that the father away in time a certain goal is, the more weight, or more significance, that is attributed to a goal (Trope & Liberman, 2000). For example, the further away in time a goal such as "losing weight in the next year" is, the more likely individuals are going to think of it according to its abstract value but as time goes on and no action is taken, the initial weight of a goal will decrease. This way of thinking of goals decreases motivation toward acting on that goal. In contrast, when goals are closer in time, these goals are thought of according to their concrete value. For example, when faced with the choice of either going to the game or going to the gym, the latter will more likely be chosen due to the immediacy of the reward (having fun with friends watching the game) instead of taking action towards the long term reward of losing weight (Bandura & Schunk, 1981; Trope & Liberman, 2000). This temporal distance hypothesis derives from another theory

stating that the further away in time a goal is, the more "cool" or cognition-based it is. While, in contrast, goals that are closer in time is more "hot" or affect-based (Trope and Liberman, 2003). When individuals think of goals in the long term, they tend to be more logical, while when thinking of goals in the short- term, decisions are much more frequently derived from emotions than from logical and reflexive thought.

AIT helps us understand the influence of holding different act identities on the effect of acting towards the achievement of goal. Even though Construal Level Theory (CLT) stems from AIT, CLT is distinguishable from AIT because AIT focuses on how actions become relevant to goal achievement, while CLT focuses on an individual's mental construction of goals. Construal level theory specifically speaks to the mental construal of goals and actions rather than looking back on their relevance. How individuals mentally construe their goals implies something about the goals' relevance, but mental construal occurs before acting on a goal. For this reason, when studying motivation, it is important to assess how goal construal can impact tangible outcomes. In addition to the actions themselves, the intention and strategic behavior towards goal achievement are important aspects studied from a social psychology perspective (Pintrich, 2000). Construal level theory can, more effectively, allow us to understand the mechanism through which holding different beliefs about a goal can impact the motivation to pursue such goals.

Construal Level Theory

Construal Level Theory describes how we understand and pursue goals based on how we mentally represent them. We can represent goals both at a low-level and at a high-level. Goals construed at a low-levels emphasize the mechanism of action, or "how" to preform concrete actions to accomplish a goal, while goals construed at a high-level emphasize the meaning of our goals or "why" we pursue a goal (Trope & Liberman, 2010). High-level construal is generally

more prone to occur when defining ones' goals and objectives than lower-level construal (Vallacher & Wegner, 1987). Distance is a factor that also plays into the construal of goals. We plan for future and distant events by creating an abstract, or "high-level" concepts of goals. Meanwhile, we think of short-term goals in more pragmatic and "low-level" ways. For example, when thinking about long-term goals, we think about things that provide meaning, such as "to have a job that helps other people" while when we think of short-term goals, such as "typing in the computer to write an essay". When thinking about short-term goals, we think about the steps of what we need to take to write and the immediacy of the due date for the essay.

Studies have shown that high-level construal of goals positively impact a goal's meaningfulness, motivation and self-concordance (the extent to which a goal is in agreement with an individual's values of themselves) (Davis et al., 2016; Wigfield & Eccles, 2000). This also aligns with expectancy-value theories of motivation which state that individuals' drive to pursue goal oriented activities derives from the expectancy of succeeding to achieve a goal (Wigfield & Eccles, 2000). Thinking of why a goal is meaningful to oneself evokes positive emotions related to the expected outcome of the goal, which can reciprocally motivate goal oriented actions.

Although high-level construal of goals is relevant for thinking of goal meaningfulness, thinking of goals at a high levels of construal is not always a positive aim to strive for. Past studies have found that low level construal of goals can be important for the details of pursuing a goal (allotting time to plan for tasks, writing steps down, drawing concept maps). Ferguson and Sheldon (2010) investigated how thinking of goals at a low-construal level is important for when individuals don't have the necessary knowledge or skills to accomplish said goals. In such cases, it is critical to construe goals at a low-level to be able to accomplish them. Having low-level

construal of goals, allow individuals to be instructed by the step-by-step process needed to accomplishing a goal. For example, when an individual does not know how to analyze statistics data, it is more constructive to think about the step by step process to get to the statistical results and then reflect on why such analysis was preformed rather than the other way around. When individuals have the knowledge and background information, thinking about "why" they are doing something increases motivation to pursue tasks because these tasks are easier to carry out.

Construal levels have been shown to have repercussions on motivation. A study by Yeager (2014), found that students who were put into an intervention group that induced thinking of a self-transcendent purpose for learning (high-level construal) increased their time spent learning and understanding the class material and were additionally more likely to spend longer time periods finishing an exam review than a control group that was not exposed to the intervention. Vasquez & Buehler (2007) have also assessed how thinking of tasks at a more abstract level helps accomplish goals, specifically in the academic realm. They found that when students envision future success (through abstract thinking) students tend to have higher levels of intrinsic motivation to perform well academically. This is because goals construed at a higher level are thought to be more important, which motivates individuals towards the achievement of such goals (Fujita et al., 2006; Liberman, Trope, McCrea & Sherman, 2007).

Self-Knowledge

Although studies have shown that high-level construal is mostly a default way of thinking of goals, it is important to understand and reflect upon one's goals and motivations in order to consciously identify actions to achieve them. This reflection requires introspection and a certain level of self-knowledge. Until recently, many theories of social psychology have explored the understanding of the self through a motivational perspective. In fact, this is how self-psychology

was developed (Tesser, 2000). In the past decade there have also been advocates for social psychology of the self to "emphasize the study of how self relates to motivation and emotion" (Silvia & Duval, 2004, p.73). While past research has looked at the impact of self-concept and self-efficacy as factors that combine to influence motivation, few have looked at the effect of the broader construct of self-knowledge on motivation.

Self-concept is a person's conception of themselves. This is a self evaluative construct through which individuals can predict how they will act in different contexts. Self-concept originates from different sources for understanding one's self. Such sources include external environments, social interactions, internal reflection and past experiences. Wylie (1979) outlined these antecedents that combine to create one's self-concept and listed sources like: frames of reference, causal attributions, and reflected appraisals from significant others, mastery experiences and psychological centrality.

People's self-concept influences how individuals act depending on the situation they are in. Several studies within the academic motivation literature have investigated the effect of minority's self-concept on how racial stereotypes and stereotype threat impact academic achievement. One example is Steele (1997)'s study which assessed domain-specific self-concepts such as girls' self-concept in mathematics. Studies have shown that minorities have lower evaluations of self-efficacy but they have positive overall self-concepts which can counteract the impact of negative self-beliefs of within specific academic domains (Pajares & Kranzler, 1995; Pajares, 1996).

Self-efficacy is another type of self-theory that has been shown to have implications for performance in the academic setting (Schunk, 1991; Pajares, 1996). Self-efficacy is the belief in one's ability to organize and execute courses of action to come to a conclusion or attainment of a

goal (Bong & Clark, 1999). Self-efficacy is less concerned with the beliefs of individual's skills and abilities, instead, it focuses on individuals' beliefs about what they can do with the skills and abilities they already possess (Bong & Saalvick, 2003).

Although self-concept and self-efficacy are factors that affect level of motivation. Self-knowledge addresses motivation in a different way because it is the core concept of both self-efficacy and self-concept. When individuals know who they are, they are able to reflect on the factors that make up who they are and will be better able to assess their capabilities in different realms. I am interested in a broader understanding of the self, rather than the belief of what one can or cannot do. The following study will analyze the impact of knowing oneself on motivation. Self-knowledge is the extent to which a person knows "who they truly are" (Kim et al., 2017). While self-concept is known to play a key role as the nucleus for organization and assimilation of concepts into ones' overall understanding of their personality, it is dependent on the external assessment of goals within a specific domain. Self-knowledge addresses the extent to which a person knows the components of themselves that are an authentic representation of who they are. Self-concept encompasses both self-knowledge and self-evaluation (Zimmerman, 1995).

Self-knowledge plays a major role in the study of motivation, because it has been shown to impact feelings of control (Zimmerman, 1995), also impacting feelings of well-being outcomes such as career and subjective well-being (Ritchie et al., 2011; Huta and Ryan, 2010). Due of its strong relationship with psychological well-being, self-knowledge is commonly viewed as one of the primary structural pillars in counselling psychology (Ryff & Keyes, 1995). Self- knowledge is also the organizational component of self-concept because self-concept has more to do with the processing and organization of information about the self.

Some studies evaluate people's self-conceptions through the assessment of their behaviors (Wylie, 1979). This aligns with behavior identification theory which states that what people do has a reciprocal effect on how they perceive themselves (Bem, 1972). This points to evidence of the reciprocal nature of actions in the development of self-knowledge, such that one's actions provides knowledge about themselves, which can then guide further exploratory behavior which affects goal oriented behaviors.

Self-knowledge allows people to clarify their intentions and ambitions so as to help them decipher how to utilize their understanding of themselves towards the aim of goal pursuit. Usually, this knowledge of themselves is derived from social comparison of others and evaluation of oneself in different contexts. Studies on self-knowledge have shown evidence of a positive relationship between knowledge of one's true self and increased motivation to pursue goals (Sheldon & Houser-Marko, 2001; Yeager et al., 2014). Past research has looked at self-concordance as a measure of the extent to which people pursue a set of personal goals with feelings of intrinsic interest and identity congruence instead of introjected guilt and external compulsion; evaluating the extent to which pursuit of goals originate from the self on a scale from an internal to an external locus of control (Ryan & Deci, 2000).

Having a high-level of goal construal implies knowing why you are doing something. High level construal of goals are influenced by two factors including: an assessment of the difficulty of the task and a certain level of self-knowledge. As mentioned, construal level is also impacted by self-knowledge. One of the sub-components of self-knowledge is the extent to which one knows ones' unique interests. Knowing their unique interests can make tasks less tedious by allowing individuals to choose activities that align with such interests (known as self-concordance), in order to accomplish broader goals. Individuals who have self-concordance are

able to perceive tedious tasks as more useful and therefore have increased motivation to achieve their goals (Davis et al., 2016).

Evaluating self-knowledge is a useful way to understand the sources of motivation. High levels of self-knowledge have been known to correlate with higher levels of goal concordance (due to increased locus of control) (Niedenthal, Cantor, & Kihlstrom, 1985). Self-knowledge is also one of the pillars of self-concept (Gecas, 1982) and has been correlated with higher levels of self-control for goal pursuit (Beaumeister & Heatherthorn, 1996). For the purpose of this study, we are using a broader understanding of the self, with the aim of understanding not just the effect of the context on a specific academic domain, we aim to have a broader understanding of how knowing oneself impacts motivation and conceptualization of goals. All of these components have a combinatory effect on the motivation to achieve goals.

Academic Motivation

Academic motivation refers to the motivation to pursue academic strides in order to achieve academic success (ex: comprehension of concepts, mastery of content, good grades etc.). Academic motivation theories have evaluated motivation through different viewpoints: ranging from assessing the sources of motivation (from intrinsic sources to extrinsic sources; Ryan and Deci, 2000), to assessing how concepts of the self, such as self efficacy (Zimmerman, 2000) influence in academic outcomes. Furthermore, theories of achievement or learning goals have been shown to influence the way individuals guide their interactions to align with their motivations for learning and goal achievement (Ames, 1992; Wigfield & Eccles, 2000). Additional evidence shows that people vary in levels of academic motivation depending on their self assessment of progress towards the end goals. When people perceive a lack of progress

towards the achievement of a goal, they are less likely to be motivated to achieve the end goal (Fishbach & Dhar, 2005; Schmidt, Dolis, & Toli, 2009).

Individuals can also range from having the most motivation derived from within the self, known as intrinsic motivation, to having a complete motivational deficit, known as amotivation. Self-determination theory describes motivation within a continuous spectrum ranging from intrinsic motivation, (a motivation derived from a volitional, autonomous and free sense of self), to an extrinsic motivation (guides behaviors from an external locus of control or experience of external pressures) (Ryan & Deci, 2000). Academic amotivation refers to the lack of motivation or intention to act, specifically within the academic realm (Kim et al., 2017; Ryan, 1995). Kim and colleagues (2017) demonstrated that self-alienation in college students predicted academic amotivation. There also might be a reciprocal relationship between academic amotivation and self-alienation. Self-alienation has also been linked to negative cognitive outcomes, such as mind wandering (Vess et al., 2016), which could then influence performance and lead to amotivation (Kim et al., 2017). We measured academic amotiovation as one of our outcome variables, which has been previously used as a reverse coded variable to study academic motivation (Davis et al., 2016).

In the academic motivation literature, there is evidence supporting the relationship between construal level and academic motivation. Higher level-construal has been proven effective for self-control strategies such as cognitive reappraisal (thinking of immediate rewards in a negative light; Fujita & Carnevale, 2012; Carnavale et al., 2015). Self-control is also necessary when striving for academic goals, because it allows for focused concentration toward the achievement of a goal. Grit, is also another factor involving self-control which has been linked to positive long-term outcomes (Duckworth & Gross, 2014; Beaumeister & Heatherthorn,

1996; Fujita & Han, 2009). McGregor and colleagues (2017) provided evidence showing that individuals with who are both highly academically motivated and knowledgeable of the impact of construal level on self-control had a tendency to earn higher grades.

This study attempts to investigate the mediational effect of self-knowledge on the relationship between construal level and academic motivation. Figure 1 depicts the mediational pathway that we are trying to assess. The present study will combine current understandings of the literature of construal level theory and self-knowledge to assess the indirect effect of self-knowledge on the relationship between construal level and academic motivation. We hypothesized that individuals with high-level construal of goals would have increased self-knowledge, promoting academic motivation. This analysis will allow provide insight into the sources of motivation and the mechanisms through which self-knowledge and construal level impact academic motivation. Another interesting point of research that can be derived from this ideas is the understanding of how self-knowledge can be dynamically constructed through different levels of goal construal.

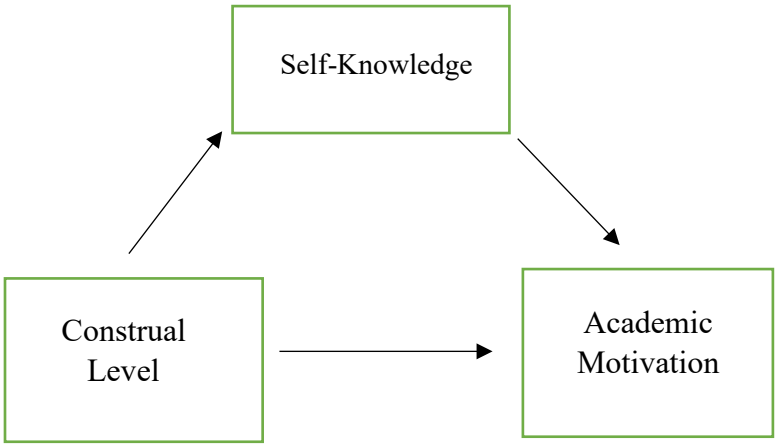

Figure 1-Mediation model

CHAPTER I

METHODS

Participants

Participants were taken from a convenience sample of undergraduate students at a large public university in Texas. One hundred and seventy six participants from a an introductory psychology participant pool who were given course credit for participating. Participant ages ranged from 18 to 21 years old. Of the total participants, 92 were female (52.8%), 81 were male (52.8%) and 3 were gender non-conforming (1.7%). Our sample consisted of 46 Hispanics, and 130 non-Hispanics. Of the non-Hispanic participants, 22 identified as Asian, 1 identified as Indian, 132 identified as "White", 9 identified as "Black or African American", 4 identified as "More than one race" and 7 identified as "Other". Participants were mostly in their first year of college (61.9%), while 45 were second year students (25.6%), 14 were third year students (7.9%) and 9 were fourth year students or beyond (4.5%).

Procedure and Materials

Participants were introduced into the lab and given the construal manipulation in a paper copy. They were subsequently asked to answer six online questionnaires assessing the different factors of the study.

Measures

There was one manipulation followed by four measures. The manipulation was a written exercise, in which participants were asked to fill out a form asking them to think about the goal of "getting good grades" indicating why (high-level construal) or how (low-level construal) to pursue a goal (view Appendix 2) (Freitas, 2004). Participants were randomly assigned to either

condition of the manipulation, which was conducted in a written portion of the experiment. The manipulation sheet consisted five rectangular boxes in a column and each box had an arrow successively pointing either upwards (high-level manipulation) or downwards (low-level manipulation) to the goal of getting a good grade (located at either the top or bottom rectangle). The high-level manipulation therefore asked successively participants "Why?" they wanted a good grade, then "Why?" to their first answer, continuing through four iterations. The low-level manipulation asked "How?" they would get a good grade in a similar manner.

As our manipulation check, participants filled out the Behavioral Identification Form (BIF) (Vallacher and Wagner, 1989) to assess their baseline action identification level. The BIF consisted of a list of academic tasks, (e.g. *doing your math homework*) in which participants selected how they perceived such tasks either at high-level identification (building your problem solving skills), or a low-level identification (typing numbers into a calculator and writing formulas).

Self-knowledge was assessed through three different scales: a mixed authenticity scale (Wood, 2008 & Kurnis and Goldman, 2006), the goal self concordance scale (Sheldon & Elliot, 1999) and the autonomy section of the well-being scale (Ryff & Singer, 1998). Our measure utilized the self-knowledge and authentic behavior subscales from the Authenticity Scale by Wood and colleagues (2008) as well as the unbiased processing and behavioral components of the Authenticity Inventory by Kernis and Goldman (2006). Participants were assigned to respond to how much they agreed or disagreed with the statements like: "I don't know how I really feel inside" on a scale of 0 (strongly disagree) to 6 (strongly agree).

The goal self-concordance scale was used to assess the extent to which academic goals align with an individual's identity and with their own intrinsic understandings of their goals. In

the goal self-concordance measure, we asked participants to indicate the extent to which they agree with statements like: “I strive for this goal because I really believe that it is an important goal to have” on a scale of 0 (strongly disagree) to 6 (strongly agree). Goal concordance is similar to the autonomy because it describes how much a certain goal aligns with an individuals’ self-concept (Niedenthal, Cantor & Kihlstrom, 1985). Individuals who are highly autonomous are more motivated to understand themselves and have a higher levels of self-knowledge. Having clarity about who they are as individuals helps choose goals that align with themselves (self-concordance) (Beaumister, 1991; Schlegel at al., 2013).

We used the autonomy scale (Becker, 1993) to measure the extent to which participants believe that their actions are pursued willingly or originate from external requirements or obligations. Autonomy is the extent to which participants act out of their own will and view their behaviors as important, enjoyable and consistent with their identity. Autonomy is related to intrinsic motivation because doing things from a sense of complete choice and volition, which increases motivation increases intrinsic motivation because such activities satisfy the needs for increased knowledge or stimulation. Knowing one’s self can also direct behavior to do things from one’s own volitional choice. Autonomy is derived from Sartre’s ideas that “being who one is” is a result of both transcendent and facticity factors, which reflect the kinds of choices and decisions one makes amid facts and possibilities within different situations. According to Sartre, people’s authentic decisions come from intrapsychic resolve that emerges from the choices found among schemas, which govern their decisions and freedom to choose. The autonomy scale measured three components of autonomy: self-awareness, sensitivity to others and capacity to manage new situations. Participants answered questions such as: “My decisions are not usually influenced by what everyone else is doing.” Responses were collected on a six-point scale,

ranging from 1 (strongly disagree) to 6 (strongly agree). Autonomy is an important predictor of motivation because it has been linked to academic success. Individuals who feel they are free to learn autonomously will most likely identify more with academics and perform better overall (Ryan & Deci, 2000).

Academic motivation was assessed by the Vallerand et al. (1989) motivation scale, which consisted of four items (intrinsic motivation, extrinsic motivation, introjected motivation and amotivation) consisting of seven questions each. This measure evaluated the reason why participants go to college by asking about the extent to which they identify with sample explanations. We evaluated the intrinsic motivation and amotivation subscales, as these were more likely to be influenced by self-knowledge. There were three types of intrinsic motivation: knowledge, accomplishment and stimulation. An example of the stimulation component of the motivation scale is: "[Why do I go to college?] Because I experience pleasure and satisfaction while learning new things" on a scale of 1 (does not correspond at all) to 7 (corresponds exactly).

To measure academic amotivation, we also used the academic amotivation scale from Legault (2006). The intention for adding this scale was to have a reverse coded variable to measure the lack of motivation due to four subcomponents: perceived lack of ability, lack of effort, lack of perceived utility and perceived lack of value. Participants were asked to indicate, on a scale of 1 (does not correspond at all) to 7 (corresponds exactly) the extent to which a list of items corresponded to the reasons why they sometimes didn't want to study or do school work (ex: "Because I have no good reason to study").

Analysis

For the data analysis we initially ran correlations to assess how the constructs related with one another. We then ran mediational analyses with the two components of self-knowledge

(behavior and authenticity) as the mediating variables**.** Finally, a two-way analysis of variance including all participants except those who fell four standard deviations above the mean, tested the levels of academic amotivation (at either high or low level construal) and self-reported self-knowledge (high or low).

CHAPTER II

RESULTS

The manipulation that we used to induce different levels of construal level thinking failed to influence the manipulation check measure (B = 0.01, SE = 0.04, t(134)= 0.28, p = .778). Since the manipulation was not successful, we collapsed across conditions for all analyses. Correlational analysis (Annex 1) was performed as a validity check for our measures. There were especially strong correlations between the behavioral component of authenticity and all components of the amotivation scale (ability, effort, value and utility). The authenticity subscale of the self-knowledge scale had two significant correlations with both the ability and the value components of amotivation. We also combined the intrinsic motivation subscale from the academic motivation scale (*Cronbach* α= .926) and the amotivation scale (α= .892) in order to test whether the overall concepts were related to one another and as a validity check to assess the correlations between them. We found that both the combined intrinsic motivation scale and the amotivation component of the motivation scale correlated significantly will all other constructs.

Self-Knowledge as Mediator

The mediational model was analyzed utilizing the Process Macro toolbox in SPSS and difference of means (ANOVA) was calculated as a way to ascertain that the manipulation worked. We were unable to reject the null hypotheses for the mediation with both components of self-knowledge as mediating variables. Nonetheless, we hereby include some of the analysis for more information about how we analyzed the data. Some pathways within the two models did show significant relationships. There were a total of eight mediational models: two groups of four, each containing the different subsets of self-knowledge (authentic behavior or authentic

self-knowledge) as the mediational variables. The dependent variable was academic amotivation. The following were the resulting mediational models.

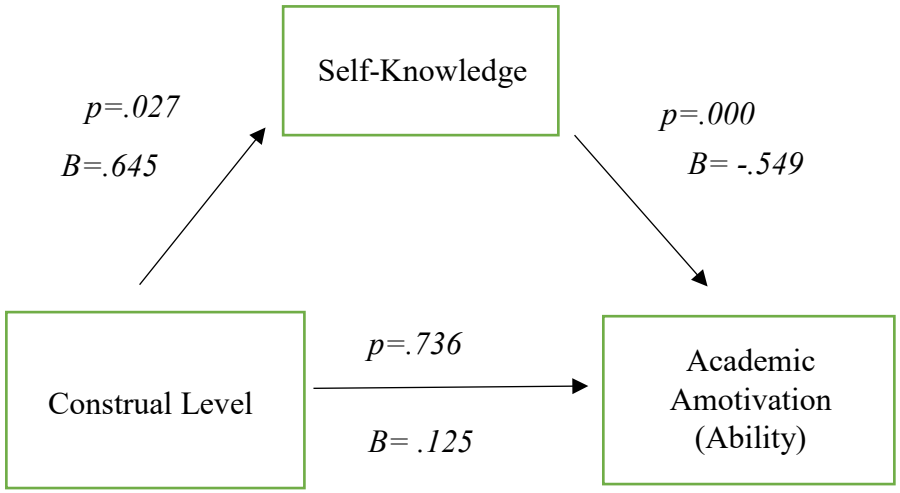

Figure 2- Mediation of the authentic behavior on the relationship between construal level and academic amotivation due to ability.

Authentic behavior as a mediator variable

Regression analysis assessing the effect of construal level on academic motivation due to lack of ability (AAIa) showed that there was no significant correlation between them (*B*= -0.23, *SE*= 0.40, *t(134)*= -0.580, *p*= 0.563) making the mediation non-significant. When the mediational model was taken into account, there was also no significant direct effect of construal level on academic amotivation (*B*= 0.13, *SE*= 0.37, *t(136)*=.34, *p*= 0.736). However, path analysis showed a significant path from construal level to the authentic behavior component of self-knowledge (AUTHbeh) (B= 0.65, *SE*= 0.29, *t(134)*= 2.24, *p* = .027), and a significant path from self-knowledge to academic amotivation due to lack of ability (*B*= -0.55, *SE*= 0.11, *t(134)*= -5.04, *p* <.05). There was an indirect effect of construal level on academic amotivation due to

lack of ability (*B*= -0.35, *SE*= 0.19*, 95% CI*: [-0.795, -0.476]) although it was not significant because there was a null effect when evaluating the initial regression.

Mediation analysis assessing the effect of authentic behavior on construal level and academic amotivation due to lack of effort (AAIe), resulted in an indirect effect of construal level on academic amotivation (effort) (*B*= -0.34*, SE*= 0.18, *95% CI*: [-0.723,-0.045]). When analyzing the mediation, we found a significant correlation between authentic behavior and academic amotivation due to lack of effort (*B*= -0.51*, SE*= .14*, t(134)*= -3.716*, p*= <.05). However, regression analysis showed a non-significant direct effect between construal level and academic amotivation (AAIe) (*B*= .048*, SE*= 0.46*, t(134)*= 0.104*, p*= 0.918).

Initial regression analysis depicted a significant correlation between construal level and academic amotivation due to lack of utility (*B*= -1.59, *SE*= 0.49, B= -0.268, *t(134)*= -3.222, *p*= .002). The mediational model for academic amotivation due to utility (AAIu) was not significant. With the mediation accounted for, there was a significant direct effect of construal level on academic amotivation due to utility (AAIu) (*B*= -1.43*, SE*=0.50*, t(134)*= -2.867-*, p*= .005). Path analysis showed no significant correlation between self-knowledge and academic amotivation (utility) (*B*= -1.43*, SE*= 0.50*, t(134)*= -2.87*, p*=.097). Additionally, no indirect effect was found

(*B*=-.157, *SE*= .140, *CI*: 95%: [-0.515, 0.406]).

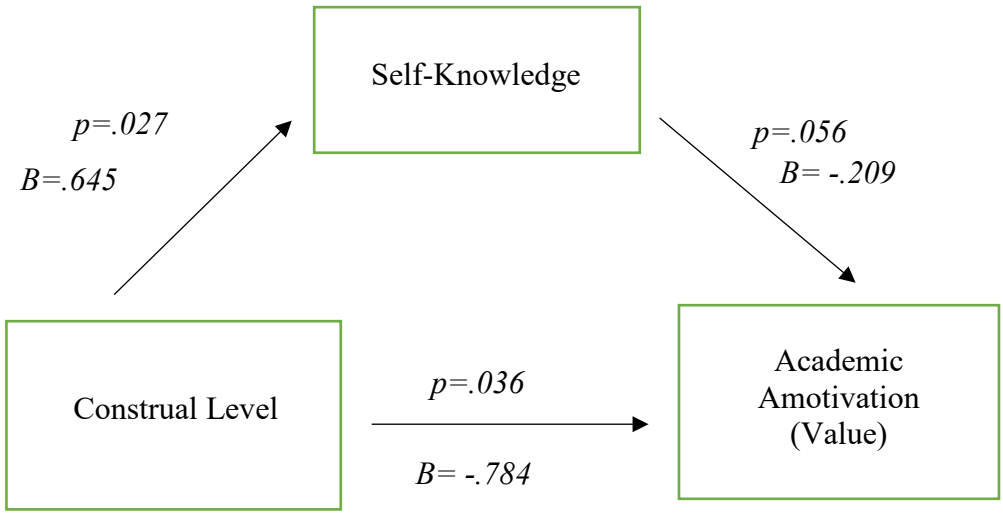

Figure 3- The mediational model of authentic behavior on the relationship between construal level and academic amotivation (value).

The mediational model of the effect of self-knowledge (authentic behavior) on the relationship between construal level and academic amotivation (Figure 3) shows that there was a significant correlation between construal level and the value subcomponent of academic amotivation (B= -0.78, *SE*= 0.37, *t(134)*= -2.1160, *p*= .036). Two pathways within the mediation reached significance: construal level was significantly correlated with self-knowledge (*B*= -0.210, *SE*=-0.11, *t(134)*=*-1.93, p*=.056), and there was a significant direct effect of construal level on amotivation (AAIv) (*B*=-0.78, *SE*=0.37, *t(134)*=2.116, *p*=.036). Although no significant relationship was found between self-knowledge and academic amotivation due to lack of value (AAIv), this relationship was trending (*B*=-0.21, *SE*=0.11, *t(134)*=-1.93, *p*= .056). There was no indirect effect of construal level on academic amotivation (AAIv) (B=-0.14, *SE*= 0.12, *CI:* 95%: [-0.42, 0.02]), consequently, the relationship between construal level and amotivation (value) cannot be fully explained by the behavioral component of self-knowledge.

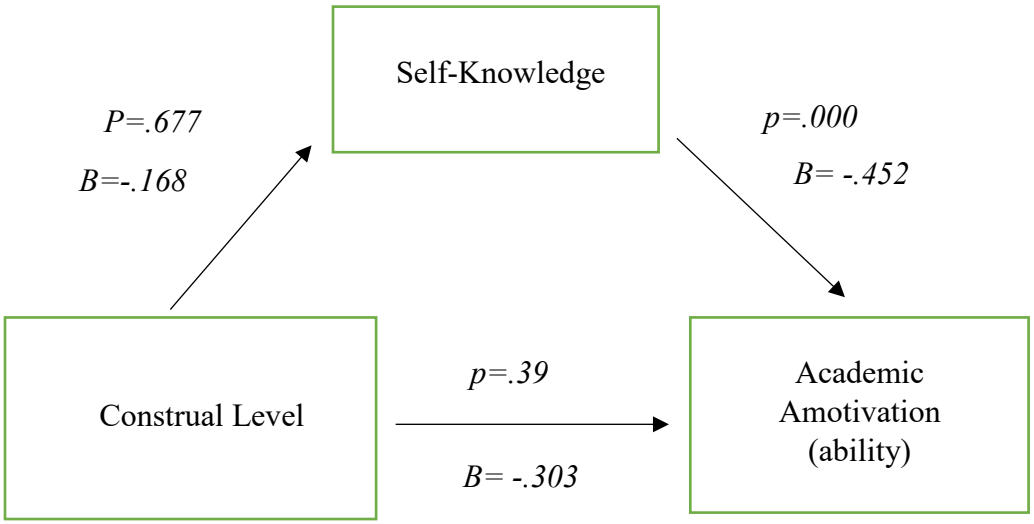

Figure 4- The mediational model assessing the effect of authentic self-knowledge (AUTHsk) on the relationship between construal level and academic amotivation (ability).

Authentic self-knowledge as mediator

As depicted in Figure 4, there is was no significant effect of construal level on academic motivation due to ability (AAIa) (B=-0.30, *SE*= 0.36, *t(134)*= -0.848, *p*= .397). Nonetheless, we wanted to know if this relationship was significant when assessing authentic self-knowledge as the mediational variable. This mediation was not significant because there was neither a direct nor an indirect effect of construal level and authentic self-knowledge (AUTHsk) (*B*=-0.16, *SE*=0.39, *t(134)*=-.418, p=.677). However, there was a significant relationship between self-knowledge and academic amotivation due to lack of ability *(B*=-0.45, *SE*= 0.08, *t(134)*= -5.675, *p*<.001). The mediational analysis showed no significant direct or indirect effect *(B*= 0.07, *SE*= 0.18, *CI*: 95%: [-0.281, 0.435]) of construal level on academic amotivation (ability).

There was also no significant mediational effect of authentic self-knowledge on the relationship between construal level and academic amotivation (effort) (*B*=0.06, *SE*= 0.16, *CI*: 95%: [-0.25, 0.40]). There was also no direct effect of construal on amotivation (AAIe) (*B*=-0.35, *SE*= .45, *t(134)*= -0.766, *p*=.445). However, a significant relationship was found between

self-knowledge (AUTHsk) and academic amotivation (effort) (AAIe) (*B* =-0.41*, SE*= .100*, t(134)*= -4.09*, p*= <.05).

The mediational model of authentic self-knowledge (AUTHsk) on the relationship between construal level and academic amotivation due to perceived lack of utility depicted no significant indirect effect of construal level on academic amotivation (utility) (*B*=0.03*, SE*= 0.08*, CI*: 95%= [-0.135, 0.218]). Additionally, no significant correlation between self-knowledge and academic amotivation due to utility (AAIu) was found (*B*=-0.18*, SE*= 0.11*, t(134)*= -1.6733, *p*=.097), but there was a significant direct effect of construal level and amotivation (utility) (*B*=-1.61*, SE*= 0.49, *t(134)*= -3.30, *p*=.001).

When assessing the mediational effect of self-knowledge on amotivation due to lack of value (AAIv), results showed that there was no indirect effect between construal level and academic amotivation (value) (*B*=.026*, SE*= .073*, CI*: 95%: [-0.129, 0.184]). There was, however, a significant pathway between self-knowledge and academic amotivation (value) (*B*=-0.16, *SE*=0.08*, t(134)*= -2.027*, p*=.045). There was also a significant direct effect of construal level and academic amotivation (value) (AAIv) (*B*=-0.95*, SE*= 0.36*, t(134)*= -2.602*, p*=.010).

Self-Knowledge as Moderator

Since neither our manipulation nor our manipulation check worked, the mediations were not significant. We decided to test self-knowledge as a mediator on the relationship between the survey measures of construal level (BIF) on the intrinsic component of the academic motivation scale and the combined amotivation scale scores.There are several explanations as to why no indirect pathways were found such as the mediation variable might not necessarily impact motivation levels, the mediation might also be in a different direction such that construal level might be the mediating variable between self-knowledge and academic amotivation levels;

similar results have been found when assessing the effect of imagining performance level at either first or third person level (Vasquez & Beuhler, 2007).

As a result, we decided to assess self-knowledge as a moderator on the relationship between construal level and academic motivation because self-knowledge might not be altering the relationship between construal level and academic amotivation but could be moderating the relationship between these variables. Figure 5 depicts this moderation. With this moderation in mind, we conducted two-way ANOVA. We predicted that self-knowledge would be a significant moderator in the relationship between construal level and academic motivation.

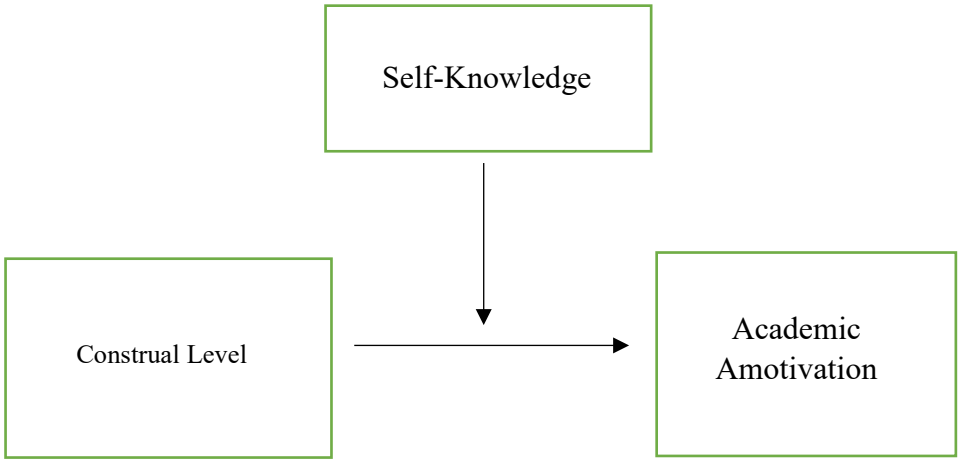

Figure 5 Moderation of self-knowledge on the relationship between construal level and self-knowledge.

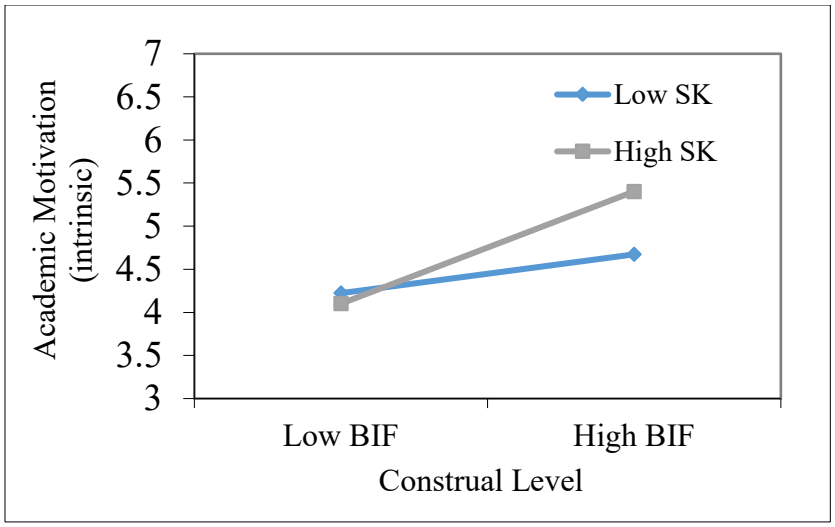

Figure 6 Regression between construal level and intrinsic factors of academic motivation controlling for self-knowledge.

Self-knowledge and intrinsic motivation

We found a two-way interaction between the combination of construal level and self-knowledge on the intrinsic factor of the academic motivation scale (Vallerand, 1992) (Figure 6). A two-way ANOVA analyzed the effect of construal level (high, low) and self-knowledge (high, low) on the intrinsic factor of academic motivation (Figure 6). There was a significant interaction of both the construal level measure and the self-knowledge measure on the intrinsic factor of academic motivation (F (133, 2) = 13.82, p = <.05). There was also a significant effect when looking at the combined effect of both the self-knowledge and construal level on the intrinsic factor of academic motivation (F (132, 3) = 11.12, p=<.05). Individuals with high levels of self-knowledge reported significantly more motivation when thinking about higher-level construal than lower-level construal of goals. Those with low self-knowledge had no significant difference when thinking of goals at either high or low levels of construal.

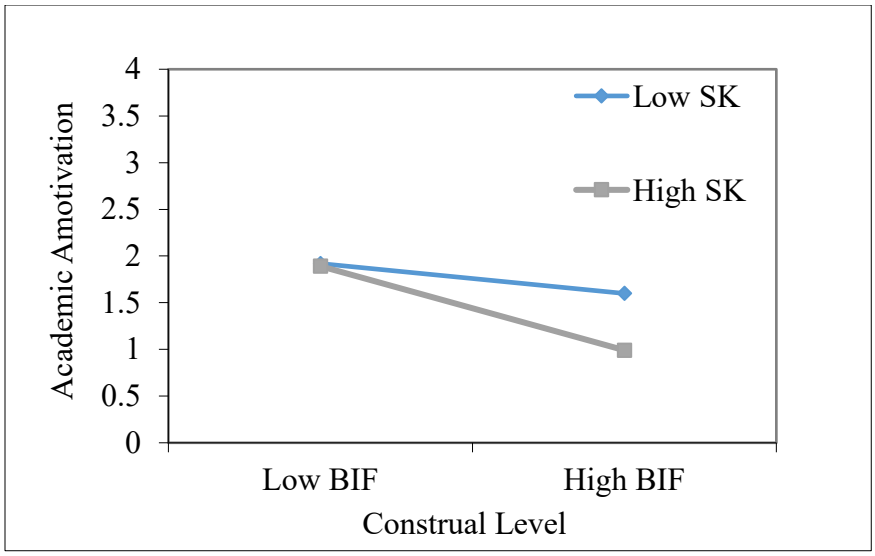

Figure 7 Regression between construal level and academic amotivation controlling for self-knowledge.

Self-knowledge and amotivation

We ran a two-way interaction between construal level and the combined subscales of the academic amotivation index (Figure 7). Figure 7 depicts the effect of construal level on academic motivation differed depending on levels of self-knowledge. Both the independent variables of construal level (BIF) and self-knowledge (AUTHsk) had a significant effect on amotivation levels (F (2, 133) = 10.248, p = <.05). There was also a significant effect of the interaction of construal level and self-knowledge on amotivation scores (F (3, 132) = 7.71, p = <.05). As expected, those with high self-knowledge scores trended toward less amotivation scores when they thought of goals at a high-level construal (p = .121), while those with low self-knowledge did not significantly vary on amotivation scores depending on construal level.

CONCLUSION

This study found that construal level is correlated with students' self-reported level of academic motivation, such that higher construal levels were correlated with less amotivation. Construal level impacts individuals' perceived ability and effort. Individuals who feel like they have the ability to successfully understand concepts and memorize information for exams, will feel less amotivated (more motivated) to pursue academic goals. Construal level impacts the extent to which individuals think they can do something (ability) or that something is too hard to accomplish (effort). These correlations were mediated by the authentic behavior component of self-knowledge, meaning that the extent to which individuals' behaviors align with their authentic belief of themselves mediates the relationship between goal construal level and academic amotivation. Furthermore, construing goals at a high level increased motivation when individuals were willing to put forth the effort and believed they had the necessary ability to accomplish a task. This effect did not hold true for lack of valuing and lack of perceived utility, showing that when individuals thought of a task as useless or not valuable, construing goals at a higher level did not increase motivation.

Individuals who had both high levels of self-knowledge (authentic self-knowledge component) and construed their goals at a higher level, were more intrinsically motivated to pursue academic goals. Having high levels of self-knowledge (knowing yourself well) was assessed by the understanding of how one would behave in different contexts and situations (behavior) and by individuals' level of understanding of themselves (as in their guiding values and principles: authentic self-knowledge).

Given the current results, it seems that the behavioral component of self-knowledge is more strongly correlated with the amotivation scale than with the authentic self-knowledge

factor. We also found that the construal level measure was correlated to the intrinsic component of academic motivation providing evidence to show that when individuals construe their goals at a higher level, they tend to be more motivated from a sense of intrinsic interest rather than external pressure. We also found that self-knowledge was correlated with academic amotivation. Students with high levels of authentic self-knowledge tended to score lower on the combined amotiavation scale, providing further evidence to support previous studies showing that self-alienation (the opposite of self-knowledge) leads to academic amotivation (Kim et al., 2018). These findings also coincide with prior research stating that higher levels of self- knowledge is correlated with increased intrinsic motivation because individuals who know themselves better, tend to have more self-concordant goals (Sheldon, & Elliot, 199; Sheldon, 2001; McGregor et al., 1998) From these results, we can imply that construal level interventions, such as the manipulation used in this study, could be conditioned by participants' level of self-knowledge. Students who know themselves well (high self-knowledge) might be able to construe goals at both high and low levels, while those who do not know themselves well (low self-knowledge) might not be able to think of goals in terms of their meaning (high-level construal).

Since this study did not replicate the impact of the construal level manipulation (Freitas, 2004; Davis et al., 2016; Yeager, 2014; Vasquez, 2007; Fujita, 2012) we are aiming to rerun the study and retest the mediation models. The lack of findings of the manipulation was most likely due to the mistaken distribution of the manipulation, which we will address when rerunning this study. It is also important to acknowledge that due to the incorrect distribution of the manipulation these results were all correlational rather than causational. This means we have to qualify the effect of construal level on self-knowledge because the lack of a manipulation makes it is hard to distinguish the direction of this interaction. In order to correct these limitations, it

would be ideal to properly rerun the study and include the construal level manipulations as the independent variable in our analyses.

. Other limitations could have stood in the way of finding significant results. One of these limitations could have been that we did not have a comprehensive self-knowledge measure. There could be other external factors (such as interpersonal bonds, feelings of belongingness and competence) influencing overall motivation that we did not account for. Additionally, we did not consider that some people might view motivation level differently depending on their physical or intellectual capabilities. For individuals with disabilities, it might be conflicting to introspect on their motivation level because of their limited physical or mental capabilities, which they could potentially conceptualize as obstructions to accomplishing their goals. To improve upon this, this study would benefit from replication in different populations and from adding demographic characteristics for individuals to choose to correctly identify themselves to the best of their ability.

Future studies could look at correlations examining the impact of construal level manipulation on intrinsic levels of academic motivation. It would also be interesting to look at two-way interactions with the behavioral component of self-knowledge because we only used the authentic self-knowledge component. Additionally, it would be interesting to assess the longitudinal effects of manipulating construal level on other, more objective, academic outcomes to test the possibility of creating interventions that promote academic motivation. Lastly, assessing the longitudinal effects of construal manipulation on academic motivation measures through more both academic outcomes (grades) and psychological outcomes (well-being, self-concordance) assessments could help other areas of psychology (clinical/counseling) to create effective interventions that address academic amotivation.

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APPENDIX A

Table 1- Correlations

Measures	1	2	3	4	5	6	7	8	9
1.AAIa	1								
2.AAIe	.382**	1							
3.AAIv	.234**	.267**	1						
4.AAIu	.267**	.474**	.524**	1					
5.AMSam	-.268**	.189*	.632**	.397**	1				
6.BIFm	-.050	-.051	-.211*	-.268**	-.310**	1			
7.intrinsic motivation	-.245**	-.243**	-.254**	-.386**	-.257**	.386**	1		
8. AUTHbeh	-.402**	-.310**	-.198*	-.186*	-.256**	.190*	.208*	1	
9. AUTHsk	-.439**	-.332**	-.161	-.129	-.182*	-.036	.138	.651**	1

**. Correlation is significant at the 0.01 level (2-tailed).

Note: BIF= Behavioral Identification Form; AAIa= academic amotivation (ability); AAIe= academic amotivation (effort); AAIv= academic amotivation (value); AAIu= academic amotivation (utility); AMSam= amotivation (from the motivation scale); intrinsic motivation (averaged: knowledge, accomplishment and stimulation); AUTHbeh= authentic behavior; AUTHsk= authentic self-knowledge

APPENDIX B

Example of High Level construal manipulation: